Earth Science Issue

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Goddard Space Flight Center

Goddard News

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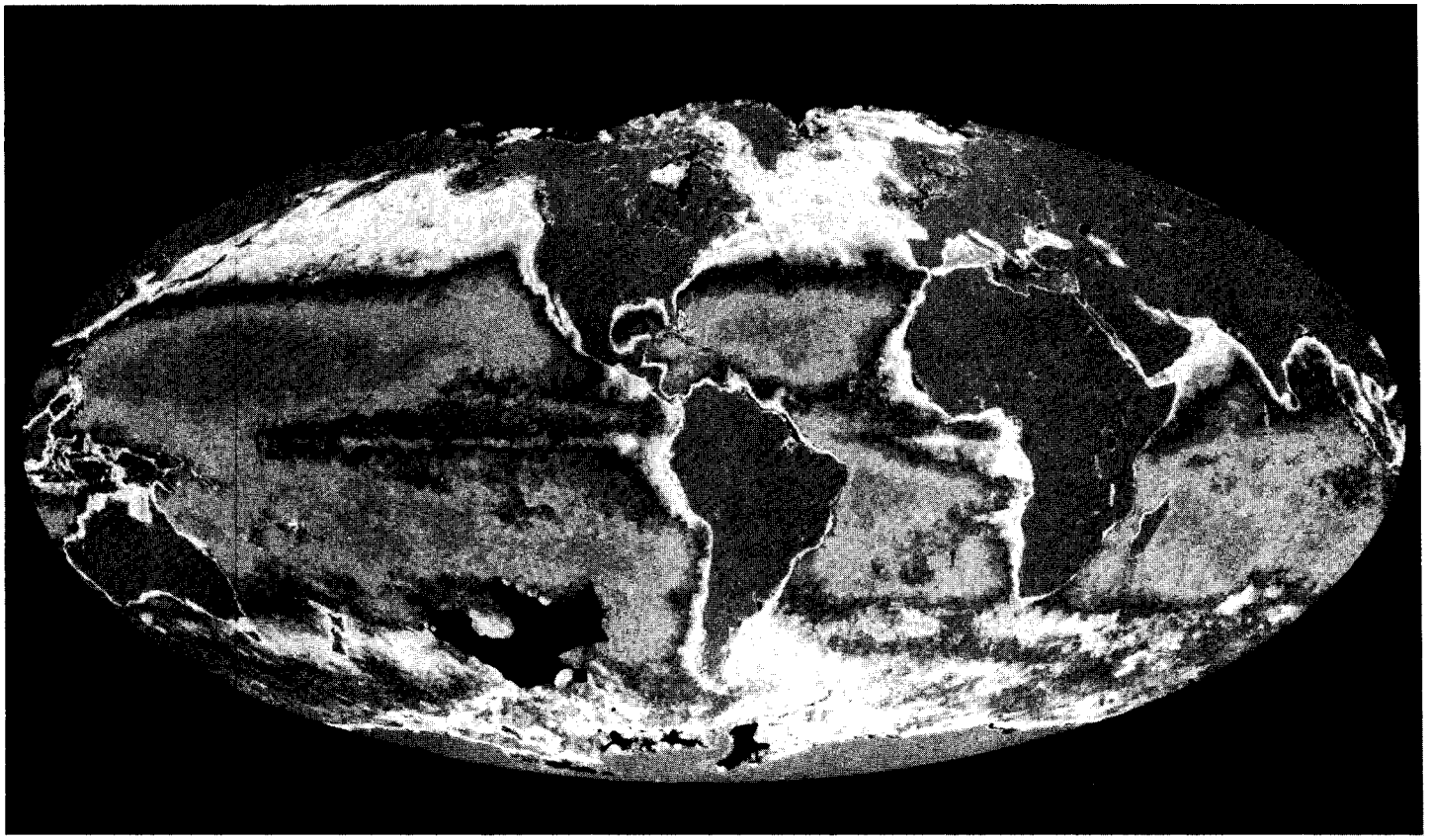
EOS Scientists Convene at Goddard for IWG Meeting



GLOBAL PERSPECTIVE—**This composite image of Coastal Zone Color Scanner (CZCS) data has become a symbol for the Earth Observing System (EOS) and its goals for measuring global change. Many of the interdisciplinary studies under the heading of EOS will produce similar composite overviews of Earth and its systems.**

More than 200 scientists convened at Goddard last month to discuss progress and problems of the Earth Observing System (EOS) at a three-day Investigator's Working Group (IWG) Meeting.

The IWG meetings provide for an exchange of information between the EOS scientists and NASA project management. At the Meeting, the Payload Advisory Panel presented a draft letter detailing its recommendations for the first platform's instruments to Associate Administrator for Space Science and Applications Dr. Lennard Fisk. The working group is presently reviewing the letter; the final recommendations will be presented to Dr. Fisk following Payload Panel Meeting in the week of August 27. Selection of instruments for the first platform will be made by September 30.

A global mission of great complexity, the EOS project is divided into seven grand theme areas: Climate and Radiation Balance; Circulation of the Oceans and Atmosphere; Global Hydrological Cycle; Biogeochemical Cycles; Ecosystem Dynamics; Atmospheric Chemistry and Ozone; Geological and Geophysical Processes.

Earth System Models is an eighth, "unifying theme," because models of Earth systems must take into account information involving all seven of the grand themes.

Goddard now has 62 people working on the EOS project. In addition, other scientists at Goddard are involved in projects that address all of these themes. Please see inside stories for a glimpse into Goddard's involvement in crucial Earth science research.

INSIDE

Dr. Gerald Soffen:

A Renaissance Man With a Global Perspective

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Talk from the Top

Q: **(This question is compiled from separate recycling questions)** *Why is Goddard still in the Dark Ages when it comes to recycling?....NASA contributes to environmental science....However, if we are to be a showcase for "practicing what we preach," we should initiate an environmental recycling system at GSFC...to show the public that we are indeed concerned with our environment.*

A: Many exciting things are happening with recycling. On the legislative level, federal and local laws now mandate recovery programs to protect our declining resources. Here at Goddard, employees interested in environmental issues have recently formed the Goddard Conservation Club to address recyling as well as other issues. Two new recycling initiatives are starting at Goddard this year. First, in building 2, the Plant Operations and Maintenance Division (POMD) is working with building occupants and the Goddard Conservation Club to develop a Center-wide office paper recycling program. This program will include collection boxes for individual rooms as well as custodial support to relocate material to a central pick-up point. When the new office paper system goes Center-wide, we will recover far more than the 1/2 million pounds we currently recover annually. Secondly, GEWA is initiating a recycling program for aluminum cans, to benefit the Goddard Conservation Club. With this program, the club will establish recycling points in each building recovering cans from GEWA soda machines. Sales of recovered cans will support Conservation Club activities. Goddard management supports all of our ongoing recycling efforts and encourages new ideas and concepts. For additional information please contact the following organizations: Paper - POMD/Frank Habas - x7831; Soda Cans - GEWA/John Wolfgang -x2219; Other Materials - Logistics Management Division/Art Wade - 5912; Conservation Club - GEWA/Dennis Kemp - 220-4169.

Center Director John W. Townsend, Jr. wants to hear from you! Send questions to TALK FROM THE TOP, Code 130.

Airborne Instrument Package Measures Tides

By Carolynne White

Scientists from Wallops Flight Facility recently flew a new complement of instruments aboard Goddard's P-3 aircraft to measure, for the first time from the air, the tide in Delaware Bay.

"The objective was to demonstrate that ocean height features can be measured from the air," according to Chester Parsons, Principal Investigator for the Multi-mode Airborne Radar Altimeter (MARA), one of the four instruments onboard. "The main application would be to measure ocean currents, such as the Gulf Stream. This information has scientific value for scientists doing climate modeling, and other ocean-related research, as well as practical applications for fishing and transportation," he said.

"We merely demonstrated the technique using the tide, because the measurements can be correlated with the tide tables, and measurements taken with depth markers along the Bay," he added. "We're now starting to reduce data, and the results look very positive so far."

Measurements were also taken with the Airborne Oceanographic Lidar system; the Principal Investigator is Bill Krabill (Code 672).

The aircraft also carried receivers for the Global Positioning System, a worldwide system of satellites used for navigation. Using these, and two receivers on the ground, the team was able to determine precisely the position of airplanes to 10 centimeters. Bill Krabill is the Principal Investigator for the GPS instruments.

Scientists from the Naval Oceanographic Research and Development Agency, Bay St. Louis, Mississippi, also participated, flying an Airborne Gravimeter that measures gravity fields over the Bay.

Ocean Wind Measurements During Rains

Radar scatterometers on satellites can be used to estimate surface winds over the ocean by measuring wind-generated shortwaves on the sea-surface. These data are useful for weather predictions and short range climate modeling. But the technique has a drawback; it doesn't work when it's raining. When rain drops impact the sea-surface, they generate circular ripples on the water surface and for some conditions, they may also diminish wind-generated waves. Storm fronts which contain rain are of high interest to both meteorologists and oceanographers. To meet these needs, scientists are developing methods to provide wind estimates during rain.

A Goddard oceanographer, Larry Bliven (Code 672), is conducting laboratory experiments to help determine methods for incorporating rain effects into the wind data retrieval programs. These studies were initiated and are continuing at the Wallops Flight Facility (WFF) using a wind-wave tank that is 60 feet long by 3 feet wide. A laboratory radar was built to simulate satellite measurements. Additionally, a small rain simulator was constructed so that ocean storm conditions can be investigated. "Although it is difficult and relatively expensive to obtain different combinations of wind and rain in the field," said Bliven, "it is much easier to apply laboratory simulation to systematically study scatterometer response as a function of windspeed and rainfall rate."

Backscattered radar power from the water surface is measured for various windspeeds, then the rain simulator is turned on to see how rain modifies the signal.

Real ocean measurements require that wind direction as well as the windspeed be determined.

"We can conduct studies in the direction of the wind in the Wallops tank," Bliven said, "but to simulate the directional variation we needed, a wider wind-wave tank was needed."

Motivated by similar interests, a cooperative research program has been established with Dr. J. P. Giovanangeli from the Institut de Mecanique Statistique de la Turbulence (IMST) in France. The tank at IMST is 120 feet long by 15 feet wide and so it provides an ideal setting for investigations concerning directional variation of scatterometer response from a wind and rain roughened water surface.

From analysis of the team's initial data, the foundation for a simple algorithm to measure windspeed during light winds is emerging. Future research will investigate higher wind speeds and also study the effects associated with enlarging the rain simulator. Recent findings from this study will be presented at the International Geoscience and Remote Sensing Symposium in Washington during May, and also as an invited paper at the Fifth Conference on Satellite Meteorology and Oceanography in London during September.

Launch Update: Three TOMS

Goddard will manage the development, launch, and operations of three Total Ozone Mapping Spectrometer (TOMS) instruments similar to the one onboard the Nimbus-7 spacecraft that presently provides data on the ozone holes in the Earth's Arctic and Antarctic regions.

The first instrument is a cooperative venture with the U.S.S.R. in which the refurbished engineering model of the original TOMS will fly onboard the Soviet Meteor-3 satellite. TOMS/Meteor-3 is scheduled for launch in August 1991.

The second TOMS will be launched as an Earth Probe under the auspices of the Earth Observing System (EOS). Now targeted for 1993, this instrument, and two subsequent instruments, will be developed under a contract which is now in the procurement process. Chuck Cote (Code 610) is the Principal Investigator for the Earth Probe TOMS, as well as the Project Manager for all the TOMS missions. Overall Project Scientist of the TOMS is Bob Hudson (Code 616).

The third TOMS has been selected to fly on the Japanese ADEOS (Advanced Earth Observation System) in 1995. The ADEOS TOMS Principal Investigator is Arlin Krueger (Code 616).

The primary mission of TOMS is to monitor ozone depletion in atmosphere, especially the growth of ozone holes in the Antartic and Arctic. These measurements can help provide trend analysis over time, and help scientists and politicians determine the extent to which ozone is really being depleted and what action to take.

NASA Pipeline

AMES-DRYDEN FLIGHT RESEARCH FACILITY, Edwards, CA—NASA research pilots have successfully tested a flight control system that detects in-flight failures and automatically reconfigures an aircraft's ailerons, rudders and elevators, allowing pilots to continue their missions or land safely. The self-repairing flight control system, first system of its type in the aerospace industry, has been demonstrated on NASA's F-15 Highly Integrated Digital Electronic Control research aircraft based at Ames-Dryden Flight Research Facility. The primary purpose of the system is to detect damaged flight control components and adjust undamaged flight surfaces so the pilot can maintain good aircraft response. When the system senses a failure, it selects the best pre-computed solution from a set of control laws loaded into the F-15's computer. The system also can constantly monitor subsystems throughout the aircraft to diagnose and identify failures that are hard to repeat and isolate during post-flight maintenance.

KENNEDY SPACE CENTER, FL—A significant modification was recently made to the Space Shuttle's braking system with the installation of newly designed carbon brakes on the orbiter Discovery's main landing gear wheels. In December 1989, work began at KSC to install the carbon brakes on Discovery while the orbiter was in the Orbiter Processing Facility undergoing preparations for Space Shuttle mission STS-31, to launch the Hubble Space Telescope. Discovery was selected to be the first orbiter to have the new brakes installed because the instrumentation necessary to evaluate the performance of the brakes was already in place. Instrumentation consists of strain gauges and accelerometers. Following successful landing tests, the carbon brakes will eventually replace the older beryllium brakes on all Shuttle orbiters. The installation of carbon brakes is one of a number of steps necessary to land orbiters again at Kennedy Space Center.

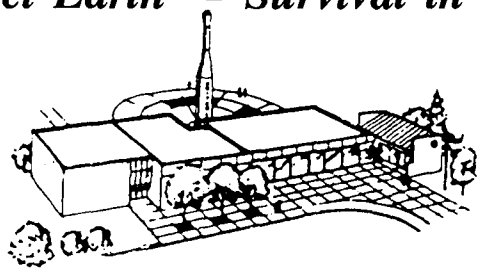
LANGLEY RESEARCH CENTER, Hampton, VA—Results from the first two years of high-speed civil transport studies suggest that technological advances will determine the environmental compatibility, marketability and public acceptance of a next-generation supersonic commercial airliner. Boeing Commercial Airplanes, Seattle, and Douglas Aircraft Co., Long Beach, Calif., recently published reports covering the first phase of studies commissioned by NASA. Based on projections for significant increases in transoceanic air travel, both companies concluded that there will be a market for commercial transports flying at two to three times the speed of sound (1350-2000 mph) between the years 2000 and 2015. According to the studies, transpacific air travel should increase four-fold by the year 2000, while transatlantic passenger trips are expected to double.

May Visitor Center Events

Mission to Planet Earth — Survival in the 21st Century

Launch Site Goddard — Sunday, May 6 and 20, 1:00 p.m. — Bring a rocket and participate or just watch the fun!

Saturday Videos — Saturday, May 12, 1:00 p.m. — Learn how satellites monitor the conditions of our natural resources and provide the first alert when trouble is brewing in "The Fractured Look."



Support Your Visitor Center
All events are free.
For more information, call 286-8981.

Know and Tell — Sunday, May 27, 1:00 p.m. — Join Dr. Wayne Esaias of Goddard's Ocean and Ice Branch for a look at "CO_2: A Threat to the future." Find out about NASA's plans to use satellites to study this problem.

Star Watch — Saturday evening, May 12, 8:00-10:00 p.m. — Enjoy a spring night viewing the moon and stars. Bring your binoculars, or use one of the Visitor Center's telescopes.

Goddard Scientists Use Unique Laser Instrument to Measure Water Vapor

by Carolynne White

A team of Goddard scientists are just beginning to see results from a series of measurements of water vapor in the atmosphere taken during a ten-day study in April 1989.

The Atmospheric Moisture Intercomparison Study (ATMIS) used four microwave radiometers and a unique Raman Lidar built at Goddard to plot the amount and distribution of water vapor in the upper troposphere, the section of Earth's atmosphere from about 4 km to 14 km.

This information is extremely significant to meteorologists interested in the movement of cold and warm fronts, and has potential relevance to the current controversy about the role of atmospheric water vapor in global warming.

"The idea that the Earth's temperature will increase is mostly based on estimates of an increase of carbon dioxide in the atmosphere," said Harvey Melfi, Principal Investigator for the Raman Lidar. "Increased carbon dioxide will, indeed, cause a small temperature increase, but the increase in carbon dioxide may also be related to an increase in water vapor. Because water vapor is a more active greenhouse gas than carbon dioxide, this will cause the temperature to rise even more."

Water vapor is also important because of its role in the formation of clouds, which in turn have an impact on temperature. Furthermore, the action of water vapor evaporating from ice and snow developed during the winter in Arctic and Antarctic regions can affect the Earth's albedo, or reflectivity.

Melfi's Raman Lidar measures the amount and distribution of water vapor in the atmosphere by sending a pulsed laser straight up into the atmosphere, and collecting the returned signal in a 30" telescope, which uses a detector to measure the scattering of the returned signal. Water vapor in the atmosphere causes a frequency variation in a tiny fraction of the returned signal. This variation, known as the "Raman" shift after the Indian scientist who discovered it, can be measured with a detector, and, when plotted over time and altitude, used to construct a plot of the distribution of the water vapor.

Construction began on the Raman Lidar in 1982. The instrument only works at night, because the laser pulse is so weak that sunshine masks the signal.

The instrument was developed by Code 674 under the leadership of Dave Whiteman. Rich Ferrare (University Space Research Corporation/USRA) developed the unique analysis routines for the lidar data.

"Ultimately, we'd like to construct another Raman Lidar instrument, find a good location, and take measurements every day for a year," said Melfi. Such measurements would be used to produce climatology data about long-term cycles for a single location.

The microwave radiometers participating in the experiment also measured water vapor. The four microwave instruments were contributed by Tom Clark and Martin England (Code 626), the Jet Propulsion Laboratory (JPL), the National Oceanographic and Atmospheric Administration (NOAA), and Penn State University.

WHITEMAN, FERRARE, MELFI

Laser Mappi

by Carolynne White

Goddard scientists are analyzing preliminary results from a NASA-wide project called GRSFE (for Geologic Remote Sensing Field Experiment), organized in fall 1989, to study a set of surfaces in the Western U.S. that were either formed by volcanic activity, or eroded by wind and water.

Goddard contributed its Airborne Terrain Laser Altimeter System (ATLAS) to the study, which combined several instruments on board a Wallops' T-39 Sabreliner to study several geologically interesting targets, including sites in the Mojave Desert, Death Valley, and a volcanic crater known as Lunar Crater, which lies within a volcanic field near Tonopah, Nevada. In return, Goddard scientists were able to add their target sites to the list to be observed.

"This study gave us the opportunity to look at Ubehebe, an ancient highly-explosive volcanic crater, through the eyes of advanced instrumentation, from a bird's-eye view," said planetologist Jim Garvin.

Ancient Volcanoes

Garvin said the volcano, named Ubehebe by the Shoshone Indians who at one time lived near and within Death Valley, once violently injected molten rock, reaching temperatures of up to 1200 degrees celcius, into the underground water table. The collision of hot rock underground with the cold aquifer under the Northern part of Death Valley triggered explosions which produced craters, some about one mile across, that closely resemble those on Mars, Venus, and the Moon. These craters are apparently several hundred to several thousand years old. The explosions also deposited a fine layer of ash-like material up to 2 miles away from the main crater.

Although Ubehebe wasn't one of GRSFE's original targets, Garvin proposed it be added to the list because of its similarity to another significant crater, Meteor Crater, Arizona, produced by a tremendous meteor impact with an energy estimated at about 20 megatons, around 49,000 years ago. Garvin hopes to compare the differences between impact and explosion craters to learn about the origins of similar craters on other planets.

"We know there are impact craters all over the Moon and Mars, but we don't know about Venus," said Garvin. "Also, there are billions of impact craters on the Moon, but we want to know if there are any explosion craters like Ubehebe on other planets, like Mars or Venus."

ng Yields Venus Crater Clues

Both types of craters produce ejecta, or debris that is literally ejected out of the crater onto the surrounding landscape. Measuring this ejecta topographically is very important in determining the crater's age, how it was formed, and what amount of energy was involved.

Laser Profile

The ATLAS instrument bounces laser beams off Earth's surface, producing a very narrow profile of the topography. Measuring how quickly the relief of the ejecta changes the further away one goes from the rim of the crater produces a unique perspective of the "shape" of the crater. Garvin compares shapes of different craters known to be impact or explosion craters to investigate whether shape can be used to determine the origin of other, less well-studied craters.

"We're trying to learn how to distinguish between different types of craters using remote sensing data sets," Garvin explained.

The team also does visual site surveys, from the air and from the ground, of these crater sites.

Garvin is also very interested in results from the SAR (Synthetic Aperture Radar) on board the Magellan spacecraft, which will provide countless radar images of craters on Venus. Comparing data from the GRSFE experiment with these images may provide clues to the origin of enigmatic craters on Venus.

"Some craters are so old they no longer look like holes, but simply appear as multi-ringed geological formations," said Garvin. These craters still produce crater-like disruption patterns when measured spectrally, however.

Another Goddard instrument that participated in the GRSFE project last fall is the Advanced Spectroradiometric Array Spectrometer (ASAS), managed by Jim Irons (Code 623). This instrument, usually used to measure properties of vegetation, was used for the first time to measure geologic surfaces, to learn more about the kinds of terrains that will be studied by NASA's Mars Observer in the mid '90s.

The Jet Propulsion Laboratory, in Pasadena, CA, provided three instruments for the GRSFE campaign: The Airborne Synthetic Aperture Radar (AIRSAR); the Thermal Infrared Mapping Spectrometer (TIMS); and the Airborne Visual Infrared Imaging Specrometer (AVIRIS).

PHOTO : J. GARVIN

UBEHEBE

Also participating were scientists from Washington University, University of Colorado – Boulder, University of Arizona, Arizona State University, and the U.S. Geological Survey.

Ultimately, NASA plans to distribute the entire GRSFE data set, and software for analysis on CD-ROMS. Meanwhile, preliminary results will be presented on May 20 at the International Geological Science Remote Sensing Symposium in College Park, MD.

Goddard to Spray Biological Agent to Curb Gypsy Moth Growth on Center

Goddard, in conjunction with a multi-agency group including the Patuxtent Wildlife Research Center, the National Park Service, the Beltsville Agricultural Research Center, and the U.S. Army Corps of Engineers, will begin a two-phase spraying of the microbial insecticide known as b.t., to curb gypsy moth infestation, with the first spraying no earlier than May 1, and the second no later than May 20.

The formulation will not affect any kind of surfaces, including paint, plastics, or fiberglass. Some small spots may be visible on an automobile surface. The spots will be more easily removed if the vehicle is washed promptly.

The insecticide b.t. is based on the bacterium bacillus thuringiensis, and is a stomach poison to the gypsy moth. Because this biological agent is less potent than chemical agents, however, it must be applied in two subsequent sprayings, each with a population reduction of about 70%.

The sprayings will cover the 8,000 acres from the Patuxent Wildlife Research Center on Rt. 197 to Greenbelt Park at Greenbelt Road and Kenilworth Avenue. The National Park Service will also spray along the Baltimore-Washington Parkway. Utility-grade helicopters owned by the National Park Service will spray this area with b.t., which is in the form of a fine, particulate matter when mixed with its latex sticking agent. The helicopter sprayings cover about 800 acres per hour.

INSIDE

Dr. Gerald Soffen: A Renaissance Man With a Global Perspective

by Carolynne White

In 1961 trained biologist Dr. Gerald Soffen responded to President John F. Kennedy's exhortation to "Ask not what your country can do for you," and asked himself what he could do for his country. The answer was "out of this world" — Soffen joined NASA's missions to Mars, the Mariner spacecraft, run by the Jet Propulsion Laboratory in Pasadena, CA, and spent six years investigating the mysteries of the planet Mars.

Now Soffen brings that extra-terrestrial perspective to his duties as Project Scientist for the Earth Observing System (EOS), a project to study global change as a product of the changing interrelationships among Earth's systems: atmospheres, oceans, land, and polar regions.

"In the past," said Soffen, "Earth was studied by looking at its parts: oceanographers studied the oceans, geologists studied the land. But planetologists have a global perspective. And one goal of EOS is to bring that global perspective to Earth Science, and use it to answer the question of how the interacting parts of Earth operate together."

Few scientists would be better suited to the task than Soffen, with his interdisciplinary background, holistic philosophy, and contagious enthusiasm.

Following his stint at JPL, Soffen went to Langley Research Center, in Hampton, VA, to serve as Project Scientist for the Viking probes, where he was responsible for 67 scientists working on 13 investigations.

"The Viking project was a great success for NASA," said Soffen. "In those years we learned more about Mars than in all previous history."

In 1979, Soffen went to NASA Headquarters to serve as the Director of Life Sciences, where his training in biology and biophysics (UCLA and Princeton) found its outlet in studies of motion sickness in astronauts, space biology/life support systems, and questions of the origin of life.

From Washington, DC, it was a short hop to Goddard. In 1983 Soffen became Associate Director for Advanced Planning, where he polished his talent for "always looking toward the future." In 1987, Soffen was appointed Project Scientist for the Earth Observing System.

"EOS is going to totally change the history of Goddard," says Soffen. "Twenty years from now, Goddard will be known for its historical role in Earth Science."

PHOTO: D. McCALLUM

SOFFEN

Soffen believes that the concept behind EOS is partly tied to a popular line of thinking known as the "Gaia" theory. Championed in modern times by writer Jim Lovelock, the Gaia theory maintains that Earth is controlled by its biological components. According to the theory, Earth is a set of interlocked feedback mechanisms, influenced primarily by biology. For example, the simple fact of Earth's dark vegetative cover affects the reflectivity, or albedo, of the planet, when seen from space.

"While EOS is much more than the Gaia theory," said Soffen, Gaia's popularity is a provocation to public thinking that will only contribute to the success of EOS."

The amount of information that EOS will generate will be so vast that we'll have to treat it differently than any other scientific endeavor, according to Soffen.

"EOS includes a system of spacecraft, but it is much more than just flying an observatory. EOS combines measuring devices (the spacecraft) with an interactive data system (EOS Data/Information System — EOSDIS) that is totally new," he said.

Because changes in Earth's systems often occur over long periods of time, the group of observations making up the EOS database will cover a ten-year period. "Like playing the stock market—to see the trends, we need long-term statistics," said Soffen.

"Two main factors make Earth unusual among planets," said Soffen. "First, because of its vast oceans, the dynamics of Earth's surface are more controlled by water than by land. Second, the living things on Earth, although representing a relatively small amount of mass, dominate the atmosphere, determine the temperature, and have very dramatic effects. Until very recently in geological history, humans had no more or less effect than Earth's other biology. But because humans are now capable of organized technology, they have the power to affect the character of the Earth. The various systems of Earth are like the systems that make up the human body."

With his goatee and his oratory style, Soffen seems more like a college professor than Project Scientist for a multi-billion dollar research project. Indeed, by his own admission, serving as Project Scientist requires him to step outside his own scientific interests and take on a managerial role.

"It's my job to serve as the scientific conscience—to guide the Principal Investigators in interpreting the scientific objectives, while adjudicating the broadest possible view. But it's great fun," he said gleefully, "because the job combines so many things. Serving as project scientist requires me to synthesize the perspectives of engineers, telecommunications experts, scientists, accountants, historians, politicians, and diplomats."

Soffen's diplomatic perspective is required by the broad international participation in EOS. It is only fitting that Mission to Planet Earth, the first scientific endeavor to truly address Earth as a global system, should be undertaken by a gathering of nations. Japan, Canada, and ESA all play significant roles in developing instruments and carrying out investigations for EOS.

And as if overseeing one of NASA's most ambitious undertakings weren't enough to keep any ten scientists busy, Soffen also supervises all of Goddard's University Programs, including internships, graduate assistantships, and postdoctoral programs.

A student of other cultures, Soffen's office is decorated with exotic hangings and figurines from his travels to Japan, India, and South America. His other hobbies include reading and hiking.

Born in Ohio, Soffen said he prefers the Washington, DC area over all the places he's lived. From his home downtown, he has a 20 minute commute—traveling the opposite direction from traffic both ways! According to Soffen, his wife Kozuko, who is from Japan, also enjoys the DC area.

CLOSE-UP

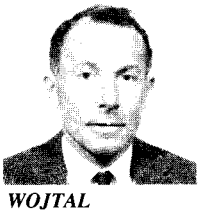
Congratulations to **PHILLIP E. LIEBRECHT** (Code 530), formerly Head of the RF Systems Section, who has been appointed the new Assistant Chief for the Tracking and Data Relay Satellite System (TDRSS). As TDRSS Assistant Chief, Liebrecht will be responsible for operations of the TDRSS, which is the primary communications system between the ground and low-Earth orbiting spacecraft for control, science data, and tracking...

LIEBRECHT

BAKER

PHOTOS: M. SMALL

the new Deputy Project Manager/ Resources for the Upper Atmosphere Research Satellite (UARS) is **RICHARD F. BAKER** (Code 430), formerly of the Earth Observing System Study Project. In his new position, Baker is responsible for all of the business aspects of the UARS flight project. "In that respect, I am responsible for development, analysis, and execution of the budget, and issuance of procurements through the procurement people assigned to our office," said Baker. "I manage the people who handle all the configuration management and logistics, scheduling, facilities management, security, and other general business aspects of the project."....Congratulations to **DR. SHENG Y. LEE,** one of six groups and individuals named as finalists in Inventor of the Year competition, sponsored by NASA's Office of General Counsel. Lee was nominated for his innovative process for making fluropolymer foams with controllable amounts of inert-gas fillings in the foam cells. Applications for this process for making these Cellular Thermosetting Flurodiepoxide Polymers include coatings, electrical insulation, and wire products such as power lines....**ROBERT J. WOJTAL,** formerly of NASA Headquarters, replaces Bruce H.S. Anderson as Goddard's Deputy Chief Counsel (Code 140). As Deputy Chief Counsel, Wojtal is responsible for providing legal advice to the Center Director and to all the offices at Goddard with respect to Goddard's activities.



WOJTAL

Media Flock to Goddard for Hubble Space Telescope Background Briefings

PHOTO: D. McCALLUM

More than 65 members of the press crowded the Goddard Visitor Center on March 15 for the T-30 briefings for the the Hubble Space Telescope (HST). A day-long event, the briefings covered all aspects of HST, from science goals, to management, to data handling.

One highlight was participation by Senator Barbara A. Mikulski (D-Maryland), who spoke of Maryland's pride in the role of Goddard Space Flight Center.

The briefings provided intensive background information on the telescope, its instruments, management structure, and events timeline for NASA personnel, as well as the media.

Public Service Recognition Week

"I've not known a finer group of people than those that I have worked with in government. You're men and women of knowledge, ability, and integrity. You work hard, you sacrifice, and you deserve to be recognized."

President George Bush, January 26, 1989

Public Service Recognition Week is May 7-13. This week is set aside to pay tribute to the profession of public service and to the unsung heroes and heroines that make up the public workforce.

Government workers are police officers working undercover to keep drugs off the street. They are meat inspectors keeping our food safe. They are astronauts exploring the frontiers of space. They are public health nurses administering vaccinations to children. They are snowplow operators working 12-hour night shifts to keep the roads open. They are park rangers protecting wildlife. They are men and women who work for all of us.

Take a moment during this week to reflect gratefully on all the good people we have—and are—in government.

Retirees

Best wishes to the following Goddard employees who have recently retired!

Name	Code	Years	Name	Code	Years
Brace, Larry H.	614	32	Podmostko, Winifred	235.1	21
Geiger, Carl	253.1	31	Sanford, Edward L.	313	26
Hahn, Jerold	564.1	32	Woodyear, William E.	711.3	26
Harris, Gary D.	684.1	35			

Soviet Scientists and ISTP Partners Visit Goddard

VISITING SCIENTISTS—Members of the Soviet development team for the KONUS instrument recently visited Goddard for technical discussions with the Goddard personnel involved in the ISTP project. Pictured, from left to right are: Donald Stilwell (Code 660); Kenneth Sizemore (Code 407); Thomas Taylor (Code 407); Dr. Yuri Guryan (A.F. Ioffe Physico-Technical Institute, Leningrad); Dr. Mario Acuna (Code 696); Dr. Sergey Golenetski (Ioffe); Dr. Georgy Skrebtsov (Ioffe); Dr. Rafail Aptekar (Ioffe); Dr. Vadim Ilyinskii (Ioffe); Sergey Khabarov (Ioffe); Donald Crosby (Code 407); Guido Porecca (EER Corp.); and Steve Pszcolka (Code 311).

Six Soviet scientists, who are Goddard's partners for the ISTP (International Solar Terrestrial Physics) project, visited Goddard for a week recently for technical discussions and to participate in a critical design review for their instrument.

The scientists support an instrument known as KONUS, a gamma-ray burst experiment, first proposed by the U.S.S.R. in 1989. KONUS will fly as a payload of opportunity in 1992 on the WIND spacecraft, one of eight spacecraft that make up the ISTP mission.

Joint Agreement

This is the first time that a Soviet instrument will fly on an American satellite. The KONUS cooperative agreement is being carried out under the auspices of the U.S./U.S.S.R. joint working group on Space Astronomy and Astrophysics.

Based on similar instruments flown previously on Soviet missions, the KONUS instrument configuration is flexible in that the number of sensors on the instrument can vary. The KONUS was originally proposed as a single sensor instrument, with this sensor located on the opposite end of the spacecraft from Goddard's Transient Gamma Ray Spectrometer (TGRS). The Soviets later requested to fly two sensor instruments; this configuration can also be accommodated.

Principal Investigators for the KONUS instrument are Professor Eugeny Mazets, of the A.F. Ioffe Physico-Technical Institute in Leningrad, and Dr. Thomas L. Cline of the Goddard Space Flight Center.

One unique feature of the project management for KONUS is that GSFC has the capability to directly send and receive Telex and facsimile (FAX) communications from Leningrad, in order to provide more direct interface between GSFC and the Soviet scientists.

The KONUS flight hardware is scheduled to be delivered from Leningrad in June 1991, when it will be integrated with the KONUS interface box being developed at GSFC. After integration and testing, the KONUS flight hardware package will be delivered to General Electric, for integration into the WIND spacecraft, by July 31, 1991. The entire WIND spacecraft will then be transported to Kennedy Space Center in preparation for a Delta launch, now scheduled for December 1992.

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